

CHALLENGES AND IMPACTS OF ONE LAPTOP PER CHILD

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INTRODUCTION

This paper describes and advocates the One Laptop Per Child (OLPC) programme as a potentially transformational approach to much-needed education reform in the region. The main challenges for an OLPC programme are explained, based on experience from OLPC trials projects in several regional countries implemented by the Secretariat of the Pacific Community (SPC) in association with the OLPC Foundation. The paper also discusses the potential pedagogic impacts, and provides some promising early feedback from the trials projects.

SUMMARY AND GOALS

The regional priorities for education in the Pacific region are embodied jointly in strategies such as the Pacific Island Forum's Forum Basic Education Plan, and nationally under the member states' own reform programmes that are supported by various donors. These priorities include improving and transforming teacher education, curricula, and vocational education, with many voices (c.f. the University of the South Pacific's PRIDE Project) calling for more Pacific cultural relevance and culturally appropriate pedagogy and content introduced into all of these areas, as well as a shift towards more progressive methods such as "active learning" and "learning by doing". There are a lot of challenges within these areas.

The OLPC or One Laptop Per Child is a charitable project which aims to place sub \$100 laptops into the hands of third world children. It is designed with content and software designed for "collaborative, joyful, self-empowered learning". Its operating system, Sugar, is a user interface that is based on both cognitive and social constructivism where learners engage in "authentic exploration and collaboration". The software projects contributing to OLPC are based on constructivist understandings of learning. They emphasise the gains through collaborative learning. They use ICT as a medium for student created content and they use visual or "drag and drop" tools to enable young learners (and teachers) to create content.

The field of study dates back to the 1980's and the Logo programming language. Seymour Papert lead a team at MIT which developed Logo and the programmable turtle as a means to engage young learners in mathematics and logic. Papert coined the term constructionism, the (N word), which was built on constructivism, (the V word), and the works of Dewey and Piaget but added the idea that *"the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe"*, (Papert 1991).

The OLPC packages a specially designed low-cost, low-power and robust learning device (which is in no way an "office computer") with a set of core principles that are designed to maximise the impacts and scalability. The approach is very different from more "traditional" computers-in-schools projects that are based around training (mostly) older children to use ICT for office applications, with limited access for younger children. The OLPC program is centred around using the computer to learn, not learning to use the computer, which is why it provides a laptop to every child to use whenever they are learning (which is all the time). This is very different from a Computer Lab approach and offers a much more powerful model to fully explore the potential of ICTs in education. The OLPC is

thus squarely targeted at young children, aimed at enhancing engagement and giving them the skills for a “life of learning”.

In addition to the “XO” laptops, as they are named, OLPC has also developed specialised school server software, designated the “XS”. This can be run on suitably selected hardware (robust, low power, etc). The school server and which adds an additional dimension – an electronic library and learning management resource centre. The server can bring massive amounts of educational materials, resources and server-based tools, even to the most remote of schools where Internet access is unlikely for many years. As a well as being loaded with resources from the national curriculum, there is a plethora of open educational resources available to support teaching and learning that can be loaded onto the servers. Through the laptop itself, and server-based tools such as wikis, the teacher and students are also empowered to create their own content and lesson resources.

If the server has an Internet connection, this is shared with all the laptops, providing access to online resources, communications and distance learning. SPC is therefore linking their Pacific Rural Internet Connectivity System (PACRICS), with it’s low-cost satellite broadband (VSAT) designed for remote and rural communities.

The characteristics of the laptops, the activity-based approach to application, and the core principles combine to create an opportunity for widespread change. As the authors see it, increasingly reflected in the ongoing trials in the region, the OLPC is an “agent of change” for the desired education reforms. However, it appears to have potential to be more than that. Because it is not merely focused on academic education, but education in a much wider sense, with capability for bringing educational resources to the wider community in respect to technical and vocational education, distance learning and life skills. Because it brings in a coordinated intervention also comprising communications and electrification, it is also a community access project, bridging the digital divide and with potential economic development impacts across the sectors. Thus, one might best summarise the OLPC as a “human development” programme. However, there are significant challenges to be overcome if the promise can be realised in practice, and current feedback on the effectiveness of OLPC as reported in this paper is as yet only based on anecdote and observation, rather than proper evaluation (although we have considered some experience in other countries that have conducted formative evaluations).

THE FIVE CORE PRINCIPLES

1. **Child ownership.** The impacts on the child’s learning will be greater if they are always immersed in the experience and always have access to a laptop. Also, compared to a traditional computer lab, the laptop stays with the child and all their family will benefit and be better able to participate in the information society. In Pacific communities, the concept of “ownership” may be interpreted differently but the result is that the child always has access to the laptop when he/she needs.
2. **Low ages.** Both hardware and software are designed for elementary school children ages 6-12. Children do not need to read or write to use them, in fact the laptops help them to read and write. The software is designed to help children in learning literacy, numeracy and in acquiring life-long learning skills such as collaborating with others, learning-by-doing, and in feeling that they are included and important (self esteem). These impacts will be greatest at an early age. The target ages correspond therefore with elementary and primary schools.
3. **Saturation.** For a truly inclusive learning environment to be established in a school classroom, every child and the teacher must have a laptop. If only some have laptops, it creates a divide with negative impacts such as a demoralising effect on those children that do not have them, and hinders the building of a strong

“community of action” amongst the teachers.

4. **Connection.** The laptops connect with each other wirelessly, and all the activities on them are enabled (or are intended to be enabled) for “sharing” – or collaboration. Anything the child does on them can be done together with others, as a learning experience. The laptops can also access the global Internet, if available, and a special School Server has been created where we can store masses of locally created and relevant educational resources, including electronic curriculum materials.
5. **Free and open source.** The laptops have been developed in a truly open and collaborative environment based on the Open Source movement. It is therefore the case that children are able to go deeper into the laptops as they learn, and even change and improve the activities. The open approach also encourages the growth of local, regional and global communities that work to develop the laptops and support local languages, local content development and in other areas. The teachers, educationalists, people producing learning materials, and importantly the children themselves, are empowered to join in these communities and participate in these developments.

OCEANIA OLPC PROGRAMME

Under the auspices of the Pacific Plan Digital Strategy, the Secretariat of the Pacific Community (SPC) has coordinated the development of three information and communications technologies, namely the network of submarine cables (SPIN), the low cost satellite-based Rural Internet Connectivity System (Pacific RICS) and the Oceania One Laptop Per Child (OLPC) initiative.

Pacific Islands Forum leaders in the Tonga 2007 meeting have endorsed all three initiatives and in the case of the OLPC have requested SPC and Pacific Islands Forum Secretariat (PIFS) to consult with Ministries and Departments of Education in more countries and to provide feedback to the 2009 Forum for their consideration. A progress report was consequently presented to the Forum Leaders Meeting in Niue, August 2008, and a fuller report presented to the SPC governing body that met in October 2008.

In response to the request by Pacific Islands Forum Leaders, SPC has negotiated and been gifted 5000 OLPC laptops from the OLPC Foundation based at MIT in Boston, to conduct a multi-country pilot with respective Ministries/Departments of Education.

As of November 2008, pilot projects have been started in PNG, Solomon Islands, Vanuatu, Niue, Nauru, and will shortly start in Tuvalu, Samoa, FSM and Tokelau. Discussions are also being held in other countries, and SPC is allocating at least a minimum number of laptops for each of the Forum countries to run trial projects.

THE PEDAGOGIC IMPACTS OF OLPC

The aims of an OLPC programme are to improve quality and achieve universal access to basic education. The technology is designed especially for children in remote and impoverished areas. OLPC is a transformational technology, because it has the potential to affect widespread change in education. It is also a “catalyst” for wider economic development.

This is in line with the sub-text to the Pacific Plan Digital Strategy of the Pacific Islands Forum, which reads “Reaching Out to Remote and Rural Communities”. However, there are also many impoverished urban populations in PNG and these can equally benefit.

To understand the potential impacts of an OLPC programme, one can start with more generally understood impacts of ICT in education, and then focus on the particular characteristics of OLPC, with its core principles, specialised technology and foundations in constructivist learning. We can then study the processes by which an OLPC project can affect change in terms of a traditional school effectiveness model, and the challenges that are presented to countries wishing to implement OLPC programmes. Finally, we must understand the priorities for education reform in the region, in the context of globalisation and the need to steer the reform towards more culturally relevant approaches in education.

A detailed list and diagram is attached in the annex, with a list of attributes, illustrates how the results of an OLPC program must take into account all of these priorities and challenges, together with a reflective management approach informed by an effective, continuing evaluation process.

THE CHALLENGES

In summary, the main challenges are given below, with illustrations of approaches that have been tried with some success during the pilot phase:

- (a) Governance. Building a sustainable coordinating body that ensures government ownership of the programme and adherence to education policy and standards, but leverages partnerships with suitable “champion” organisations, usually NGOs including academic institutions, to provide and build the national capacity to run trials, develop a national strategy and then scale up OLPC roll out.
- (b) Teacher Training. Teachers must be trained how to integrate the laptops into their teaching and facilitate the children’s learning with the laptops and associated servers and content. One strategy is to seed capacity in the teacher education institutions of a country, as is the case in PNG with Divine Word University and Don Bosco Technology Institute, who are introducing OLPC components into their curricula so that their graduates will have a certified level of familiarity with the OLPC principles and technicalities, which will eventually be accredited in some way by the Department. The teachers of the trials projects are pioneering teaching ideas with the laptops, following initial training. A supportive relationship can be built up with the teaching schools, who can develop new methods of curriculum integrations and so on, and reflect on the experience of the teachers. Included in this challenge is making sure that these activities are linked back to the education system via the school inspectors and local education officers, so that there is adherence to standards and accountability.
- (c) Power infrastructure. This is a technical area, but although the laptops use only 5 Watts each, a large school in a rural area with no grid power presents a challenge to enable recharging each day. SPC is looking at many solutions. Leveraging their global position, OLPC Foundation with their partners have developed some very reduced price, appropriate designs for solar power supplies (such as flexible solar panel “blankets” costed at USD 2.50 per Watt, and multiple channel battery chargers). Another potential solution currently being investigated in the Solomon Islands, involves diesel generators that run on coconut oil that is produced locally with appropriate technology. The schools involved are located near underused copra plantations, with a plentiful supply of copra. Teachers like the idea, and say that one effect would be that parents could send more children to school, paying fees with coconuts. Unused oil would be bought back by the local company supplying and supporting the generators. Whatever the solution to be used, a site by site approach is required – as there are often local “work arounds” and partnerships that can help.
- (d) Content and curriculum integration. The OLPC allows curriculum departments to look at new ways of creating and pooling education resources with their neighbours in the Pacific. Related to this, is

Commonwealth of Learning's "L4C" Wikieducator training programme in the region, including new ways of collaboration to create an access open education resources. The voices from educators in the PRIDE workshop series "Teacher Educators on the Move" (2007) call out for such regional collaboration. The laptop has the potential to empower teachers to create their own content, which can be shared more widely, and in direct input to curriculum development. Local content can be loaded on the servers from other providers, such as development programs dealing with conservation, HIV/AIDS, fishery management, to lifestyle and promotion of the Pacific identity and cultures. For instance the SIL (sil.org) group have "bible translators" all over the region, embedded in communities working closely with primary school teachers. In PNG they have made available several examples of local language "PDF Readers" for the OLPC – electronic books aimed at 6-year olds upwards, on relevant topics and very culturally sensitive.

FEEDBACK FROM THE TRIALS PROJECTS IN PNG

In PNG, trials were started in June 2008 at Gaire and Dreikikir. Only grade 3 was involved in each school owing to availability of laptops at that time. Also, insufficient training was given. However, arrangements made to complete both schools so that all teachers and students will receive laptops, by the end of the year. The implementation will involve full training for teachers and introduction of support and monitoring arrangements. DWU and DBTI will be playing their roles as described above.

A properly conducted monitoring and evaluation process is required. However, this has not yet been introduced by the PNG Department of Education, which is yet to develop an objectives framework and implement the monitoring and evaluation component. However, there are some observations that can be made following the five months since the trials were started in June 2008. The SPC advisor visited both schools in November 2008 accompanied by representatives from the Department. Teachers were asked to give feedback.

This feedback is in no way a substitute for a proper evaluation. SPC has plans for these, wishing to work with appropriate agencies and institutions. Part of the strategy for the trials is to work with Departments of Education to develop objective frameworks which can be measured. This is the case so far only with the Solomon Islands, where an evaluation framework was drawn up by the Ministry's technical working group as part of their sector wide programme. The framework is attached in the annex.

FEEDBACK ON DREIKIKIR

Feedback from teachers

- Enormous enthusiasm. They really see the value of the programme and the head teacher is requesting the additional XOs immediately.
- Motivation of grade 3s has soared, teachers too. Demand for transfers in to Dreikikir are increasing, and two teachers who have been promoted and have to transfer out were almost in tears as the prospect of leaving
- They have been amazed by the self learning capacity, with learning continuing out of class, and obvious skills and knowledge of the grade 3s. The kids gave a demo and they were bursting with confidence, quite unlike their shy former selves during training in June.
- They have been using the XOs in lessons on a regular basis. Both guided and unguided. Examples, regular use of Record in science to investigate natural objects, calculate, write, speak.
- The teachers say that they totally accept and endorse the "agent of change" characteristic of OLPC, in terms of teaching practices. It is extremely timely as the same intended changes (active learning etc) are part of the current reform process. The XOs fit with that perfectly.
- The teachers report that the grade 3s are noticeably improved in terms of engagement in learning and motivated in and out of class. All children are now more included with fewer children being left out.

- Head Teacher Peter Kantipil did a test with his grade 3 class, giving them a grade 4 task. When evaluated they came out better than the grade 4s. They think this is directly due to their improved learning since June. (Note, a DWU researcher is interested in doing a 2-year study on IQ of students using XOs)
- On the other hand, the other grades are demoralised by not having XOs. This is a real negative impact, and adds urgency to saturate the full school.
- The teachers used the laptops to take photos to add to their attainment certificates in colour (each child has one end of year)
- Community also very positive. During the demo, the children showed how they have filmed music DVDs so they can play them on their XOs at home, also one showed me an official letter that his Dad had written using the XO, so its useful at home. But the self learning is well noted by the parents
- Hardware: only 1 laptop u/s (but they will try to reflash it). One has no audio. Others all look pretty well looked after.
- The main issue – power – is solved. The school bought a 5KVA generator specifically to charge the laptops, and have been doing a once a week in-school charge with the students finding power in their homes on other days. This is not enough for 300 laptops but can be done in two daily charges. They have grid power in evenings and will get that connected to school buildings.

FEEDBACK FROM GAIRE

- The children love the laptops, and have become experts in the eyes of the teachers
- The teachers are extremely positive and don't feel any way imposed upon
- The main observation is the power of the laptops in helping the children to learn and discover things, beyond the school. They have become experts
- One example, they have already discovered creating games with "Memorise"
- The children have become very busy in the classroom – i.e. very engaged in what they are doing
- They are very impressed with the creativity of some of the students, for instance the standard of drawings using Paint is quite out of the league of the adults!
- The G3 teachers use the laptops quite a lot in class, both guided and unguided. They can allow the students quite a lot of freedom to use activities to tackle various tasks.
- One teacher listed some guided uses:
 - Write
 - Calculate
 - Tamtam
 - Paint
 - Chat (they found it is quite useful in class)
- They did a school survey that involved creating music with the laptops
- The deputy head teacher has a G3 child, and he has made a lot of positive observations. He could also speak as a parent. He gave his child a question on science, and the child researched the answer on the Internet! This is a grade 3, 8 year old.
- Teachers have been using/borrowing laptops to research material for their lessons, as well as downloading materials and sending emails.
- The children line up outside the RICS and use the Internet quite often
- This is evidence of the added value of the RICS
- As with Dreikikir, the ones without laptops have been a bit demoralised. One teacher very eloquently explained that until the whole school was saturated, judgement on the laptops is unbalanced.
- Teachers were very aware and supportive of the need to monitor and evaluate, and to involve the Province in this task
- Two laptops of the 53 had problems, one has half the screen distorted (horizontal lines) and one has the dead battery syndrome. We managed to get the battery charging again although it is only very slowly taking up charge.
- They could not think of any negative impacts.

OTHER FEEDBACK

- Two members of the Department accompanied the SPC advisor to Gaire on Sunday 23rd November and witnessed the skills demonstrated by five Grade 3 students and their teachers, in preparation for the demonstration at the press conference scheduled for Parliament. The students displayed advanced skills and the teachers illustrated guided learning.
- The Gaire teachers reported a visit by School Inspectors, who witnessed Grade 3 lessons with students using the laptops. The teachers stated that the inspectors were very impressed.

There is some excellent indication of the potential with children with disabilities. When Divine Word University (DWU) conducted teacher training for 87 teachers from schools in the area at St. Benedicts in October, they invited people from Callan Services, an international NGO that has centres around PNG helping people including children overcome disabilities. Some teachers from Callan Services in Wewak attended the DWU training and immediately saw the potential. Dr Alfred Tivinarlik, Dean of St. Benedicts, captured on video the Callan Services teachers using the laptops to create visual resources for teaching sign language. They also have a centre in Kiunga, where PNG Sustainable Development plan to start OLPC projects in their areas of interest.

OLPC AS A CATALYST FOR WIDER ECONOMIC DEVELOPMENT

An OLPC program is not just about laptops. Because it is a coordinated development program, that involves the whole of a community, it brings with it not only improved basic education but bridges the digital divide. The OLPC programme will bring with it (by necessity) an integrated approach power and communications infrastructure in the rural areas.

In terms of educational benefits, the program can extend from the schools into the communities. There are many potentials in terms of human development, and linkages that can be made.

However, it is clear that in order to scale up OLPC projects to national level, where the “transformational” aspects can be realised, it will require coordination at many levels. The sustainability will depend on coordination in development planning through national ICT strategies linked to policy development, with strong programming linkages.

ANNEX 1: THE POTENTIAL EDUCATIONAL IMPACTS OF OLPC

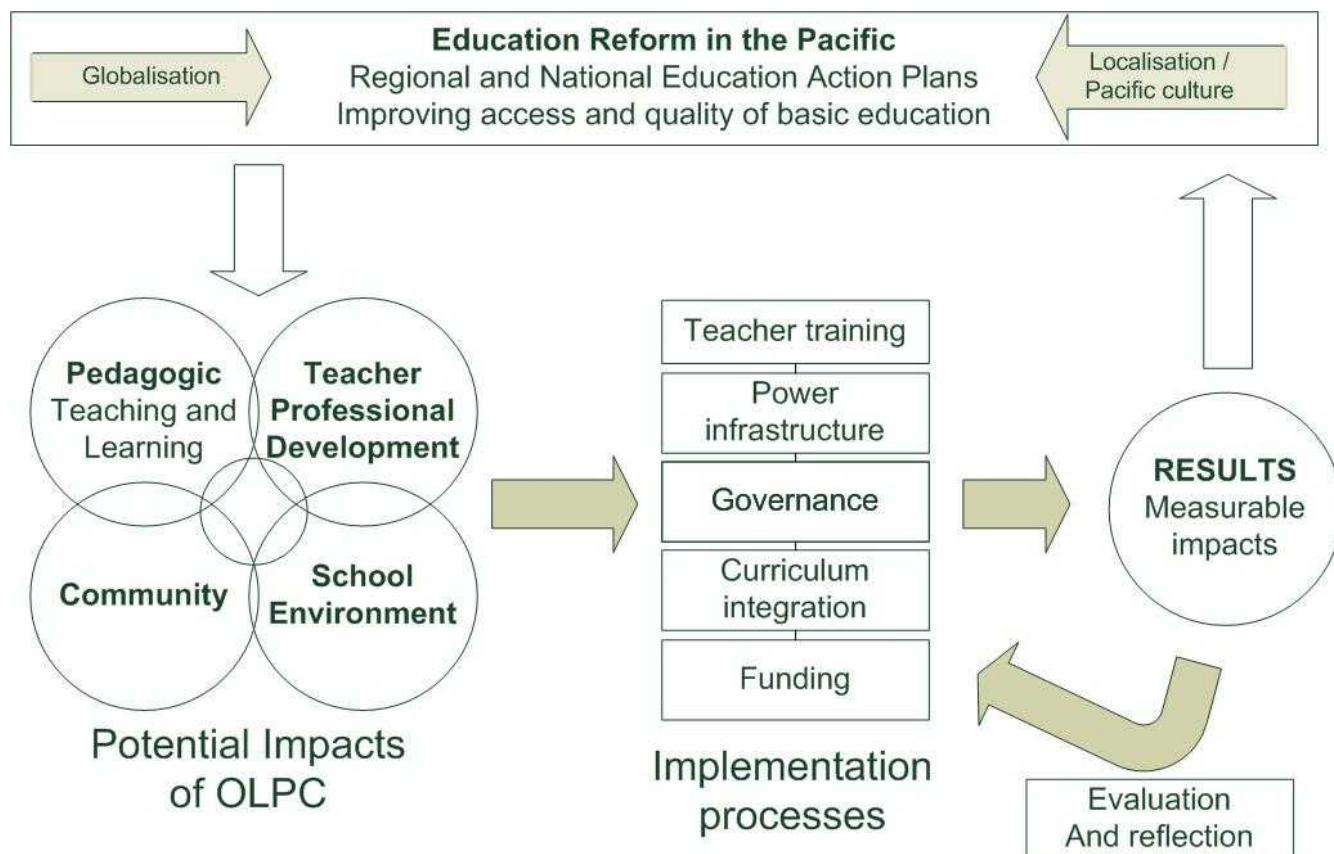
INTRODUCTION

To understand the potential impacts of an OLPC programme, one can start with more generally understood impacts of ICT in education* [1], and then focus on the particular characteristics of OLPC, with its core principles, specialised technology and foundations in constructivist learning [2]. We can then study the processes by which an OLPC project can affect change in terms of a traditional school effectiveness model, and the challenges that are presented to countries wishing to implement OLPC programmes [3]. Finally, we must understand the priorities for education reform in the region, in the context of globalisation and the need to steer the reform towards more culturally relevant approaches in education [4].

*Note that many ICT initiatives in Education start with a Computer lab model. OLPC put the laptop in the hands of the teachers and learners all the time so that they can use the tool whenever they need to learn. This is a very different approach gives very different results.

DIAGRAM

The diagram illustrates how the results of an OLPC program must take into account all of these priorities and challenges, together with a reflective management approach informed by an effective, continuing evaluation process.



THE XO AS AN AGENT OF CHANGE FOR EDUCATION IN PACIFIC

In many overseas countries, OLPC has been effectively used as a Change agent for the education system and in fact, the OLPC program was designed around this principle

- Helps integrate and support local cultural values into education system,

- Helps shift to more culturally relevant ways of learning
- Opens up new ways of pooling and sharing resources, and for collaborating, especially across the region
- Offers new highly scalable approaches to the localisation and development of relevant educational resources
- Helps change from a Teacher centric model to a Learner centric model
- Facilitates bridging of distance in teaching, learning and education
- Helps shift focus of educational goals to lifelong learning, communications and IT competence, information-based employment, etc
- Helps build intercultural communities of learners and educators within the Pacific to counter the dominance of external influences

LEARNING ENVIRONMENT

- Teaching methods are affected positively through the use of the XO in T & L, including more/improved:
 - Guided Learning by Doing
 - Learner-focused teaching
 - Group learning /sharing/collaboration
 - Inclusion / engagement of all students
 - Curriculum development to suit the new environment
 - Impacts seen in all education sectors, but mostly with early age education (ECE and PE)
- Active learning and authentic assessment is promoted by the ICT. Examples:
 - Using the Record activity to photograph natural objects studied in science
 - Interacting with students in another country via e-collaborative activity
 - Using TamTam to simulate music from other cultures
 - Using the text-to-speech synthesiser (Speak) to learn how to pronounce new words (i.e. in English)
- The XO is used to investigate reality and build knowledge
 - Through scientific and measuring tools on the XO
 - Through learning research skills with improved access to resources, on server and via Internet
 - By collecting and analyse data, using the XO
- Impacts on basic education:
 - Basic literacy and numeracy improved through specific reading/writing and numeracy activities on the XO
 - Localisation features help implement teaching in the vernacular for early ages
- Improved engagement of students by motivation and challenge, for example
 - Using the word processor (Write) activity with the multimedia functionality to create autobiographies, etc
 - Solving problems using the scientific tools
 - Using the XO adds variety and stimulation
 - Learning embedded in games formats, with multiple levels of challenge
- The technology provides tools to increase student productivity
 - Using the XO to reduce repetition of low-level tasks and through sharing and building
 - Teachers can review students work on line
- The ICT is used as scaffolding to promote higher level thinking
 - Modelling / visualisations tools / activities on the XO
 - Allows a deeper study of issues through access to better resources
 - Using word processor (Write) to edit narratives into different tenses, etc.
- Increased learner independence through use of the ICT
 - Students learn to research and self-learn
 - Access to educational materials and learning via distance
 - Development of Information Literacy skills
- Increased collaboration and cooperation
 - The XO is unique in that collaboration is a core functionality and principle

- Group work and activities
 - The ICT can enable participation in activities beyond the school, for instance a marine conservation project involving schools throughout the region
- Learning is tailored to the learner
 - The Speak activity can be used to read out aloud text from a book, etc
- Physical disabilities can be overcome
 - Through improved community education, changing attitudes to disabilities
- Curriculum and supplementary content made available electronically via school server
- Resources made available over the world wide web for
 - Professional development of teachers
 - Research by students
- ICT helps teaching practices to be more culturally sensitive. More regionally and locally relevant curriculum resources made available. Examples include:
 - Intercultural exchange within the region is made easier
 - Sharing of educational resources between countries in the Pacific becomes possible
 - Local content development by teachers made possible, locally and collaboratively over distance
- ICT helps teaching practices keep in tune with student attitudes/aspirations, which are changing because of globalisation.
- Enables teaching and learning of information literacy
 - Developing skills for the Knowledge economy

SCHOOL ENVIRONMENT

OLPC projects around the world have seen an improved relationship between the school and the community. This comes from

- Increased enrolment or improved attendance, absenteeism of teachers and learners reduced
- Improved discipline
- Teachers have improved morale and work together to learn to use the laptop
- Parents take a stronger interest in their child's education
- Computers used to inform school administration on student performance, enabling effective change
- School administration more effective
- Higher demand / enrolment / retention (teachers and students)
- Teachers and students regard the XO and OLPC project positively

TEACHER DEVELOPMENT INDICATORS

An early indicator of development in teachers is to see the teaching resources they are using and any professional development work they are engaged in. OLPC facilitates

- Networking and collaborative tools such as UNESCO-TOFI and 'Wiki Educator' used by teachers
- Local content developed by teachers and students
- Teachers receiving training support via distance mode, and access to continuing education
- Teachers are able to integrate the use of XO in formal and informal class-work
- The XO is used in Teaching and Learning
- Teachers have improved access to resources and training support

THE SCHOOL WITHIN THE WIDER COMMUNITY

- School seen more positively by the community
- More involvement or active participation of parents in the school

- Using the ICT to enable learning activities that involve the community
- Community have improved access to information and communication services
- Rural economy benefits from improved communications

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ANNEX 2: SOLOMON ISLANDS OBJECTIVES AND EVALUATION FRAMEWORK

Objectives	Expected outputs	Indicators and instruments (how it is measured)
Awareness raised about OLPC and the objectives of the trial in Western Province	Ministry, teachers, sector partners and communities aware of: The vision of OLPC The function of OLPC/XO/XS Objectives trial in the Western Province.	<ul style="list-style-type: none"> Consultation and briefing meetings held with the Ministry, schools and communities Interviews and survey
To assess the impact of OLPC in the area of Teaching and Learning (In each sub-sector: Early Childhood, Primary, Secondary, TVET)	<ul style="list-style-type: none"> The XO is used in Teaching & Learning at schools and centres The XO is utilised in particular for some of the subjects The XO is integrated into normal/formal T & L- formal education delivery Teaching methods are affected positively through the use of the XO in T & L, including more/improved: <ol style="list-style-type: none"> Learning by Doing Child-focused teaching Group work/sharing/collaboration Inclusion / engagement of all students Curriculum changes as a result of the XO/ OLPC project Impacts seen in all sub-sectors, but mostly with early age education (Early Childhood Education and Primary Education) Also assess any possible negative or non-impact; learners and teachers not using XO or only after school hours 	<ul style="list-style-type: none"> Interviews and surveys with school managers, teachers, students, students, community members Teacher log books/diaries Class observations Demonstrations by teachers about the workings of XO Increased use of XO by learners in formal lessons and after school hours
To assess impact of OLPC on enrolment or attendance	Increased enrolment or improved attendance at selected schools compared to schools where OLPC or XO has not been introduced	<ul style="list-style-type: none"> Attendance register
To assess impact of OLPC or XO in delivering/producing new curriculum materials/learning content	<ul style="list-style-type: none"> New electronic content made available (in schools) The school server is an effective source of content 'Wiki Educator' more frequently used 	Materials provided by School Ministry/curriculum NGOs / partners of education sector OLPC Oceania / SPC
To assess if OLPC/XO-technology is technically feasible and sustainable	<ul style="list-style-type: none"> Teachers and students are able to use and continue to use the laptops Power supplies are feasible, affordable Good quality Internet connectivity Required level of technical support, maintenance is available XO-Equipment is reliable, functional and still working Interviews, consultations and surveys 	<ul style="list-style-type: none"> Demonstrations by students, teachers Technical report on power and connectivity infrastructure Options, performance, cost, Number and type of equipment failures
To assess impact of capacity building for teachers (and learners) in the OLPC project	<ul style="list-style-type: none"> Training (for XO) has built sustained capacity Training system/schedule and methodology is effective Teachers are able to integrate the use of XO in formal and informal class-work Teachers have improved access to resources and training support 	<ul style="list-style-type: none"> Interviews, consultations and surveys with trainers, teachers and learners Evaluations of training, capacity building
To assess the impact of OLPC on the learning, and school environment	<ul style="list-style-type: none"> Teachers and students regard the XO and OLPC project positively School seen more positively by the community Teachers have improved morale Absenteeism under teachers and learners is reduced Higher demand / enrolment / retention (teachers and students) 	<ul style="list-style-type: none"> Interviews, consultations and surveys with teachers, learners and community members School records, minutes of school board/committee meetings Public meetings Parents meetings Inspectorate visits Note: OLPC/SPC will provide advice on survey

		instruments/questionnaires/inspections
To assess the impact of OLPC, XO's on the community	<ul style="list-style-type: none"> ● To assess the impact of OLPC, XO's on the community Also community members involved in the use of XO's Community regards the OLPC positively or negatively Community have improved access to information and communication services More involvement or active participation of parents in the school 	<ul style="list-style-type: none"> ● Interviews, consultations, surveys with community members, teachers, learners Minutes of school committees and boards Group interviews with community members Demonstrations of parents using these XO's